

## **Chapter 2:**

# **DEVELOPMENT CONDITIONS AND TRENDS**

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## ENVIRONMENTAL CONDITIONS

While principally an agrarian landscape for the past 150 years, significant environmental features do remain in Clay Township.

The most significant environmental feature in the township is the White River and its associated flood plain and riparian areas. Situated on the eastern boundary of the township this river landscape relates significant natural and historical legacies of the township. The floodplain area of White River is fairly extensive along its western bank. In certain segments this floodplain reaches nearly 1/2 mile away from the centerline of the river and provides for the most extensive expanse of undeveloped and natural landscape in the township. Other streams and creeks traverse the township in a northwesterly alignment, eventually draining into White River. While Cool Creek has been predominately urbanized its most basic floodway has been preserved as a natural amenity along Brookshire Golf Course. Williams Creek, west of Meridian is another environmental corridor which has large segments still undeveloped.

Another environmental feature associated with waterways which exists in the township is wetlands. Several wetlands as designated on the National Wetland Inventory Maps exist in Clay Township and have been noted on the "Significant Environmental Features" map on page 2 - 3. These are not "Jurisdictional Wetlands" as defined by the U.S. Army Corps of Engineers. To meet the Corps' Delineation Manual criteria a wetland must possess all of the following characteristics; 1) hydric soils, 2) hydrophytic vegetation, and 3) hydrology. Any proposed modification to the designated wetlands on the Open Space/Environmental Features Map should be subject to a thorough analysis to determine wetland status.





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The four basic soil types found in Clay Township are described in the “Soil Suitability Map” on page 2 - 4. The distribution of these soil types has had a significant impact on the urbanization pattern of the township. The most extensive soil type in the township is the Crosby-Brookston variety. Existing in over half of the township, predominantly west of Keystone, this soil type exhibits good characteristics to support agriculture and poorer capabilities, due to its wetness, for urban uses. The Miami-Crosby soil and Ockley-Westland Fox soil varieties present the best soil qualities in the Township for urbanization. Conversely, the Shoals-Genesee variety typically found along waterways is characteristically poor due to flooding.

From the period between 1830 and 1970 the vast majority of the township was used for agricultural purposes. A recent study conducted by the Indiana Department of Transportation (INDOT) for U.S. 31 indicates that less than 10% of Hamilton County remains as woodlands. Very few original woodland areas have survived in Clay Township. The “Significant Environmental Features” map identifies those concentrations of woodland areas which remain in Clay Township which are greater than 50 acres. Most of these woodland concentrations occur along White River or other streams and tributaries such as Cool Creek or Williams Creek.

The topography of Clay Township is gently rolling to flat, with the greatest topographical relief occurring along White River. There are no apparent unusual underground geological features in the area such as caves, mines or sinkholes which could impact development.

Groundwater is a significantly important feature in Carmel and Clay Township as the water supply system for the City of Carmel and rural residents comes from the groundwater. The groundwater sources occur in the sand and gravel aquifer

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system of the West Fork of the White River valley. Groundwater in Clay Township is available at depths of 50 - 400 feet in the glacial drift with wells yielding several hundred gallons per minute. The City of Carmel has over 20 groundwater well sites predominately located between Cool Creek and the White River, with a handful of other sites located west of this area. Recently, the City of Carmel has sought to protect the integrity of these wellsites by acquiring a circumferential land area radiating 200 feet around each wellhead. This circumferential area is termed a “wellhead protection area”.

Other significant environmental features are the Monon rail right of way which traverses the township in a northwesterly direction and numerous major utility corridors.

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## GROWTH CONDITIONS

The urbanization of Carmel and Clay Township has been swift. As noted on the adjacent charts, the township has seen over half of its 50 square miles of land area developed during a 25-year period.

Beginning in the late 1960's the population of Carmel and Clay Township exploded. As noted in Figure 1, the population of Clay Township grew from 10,200 in 1960 to just

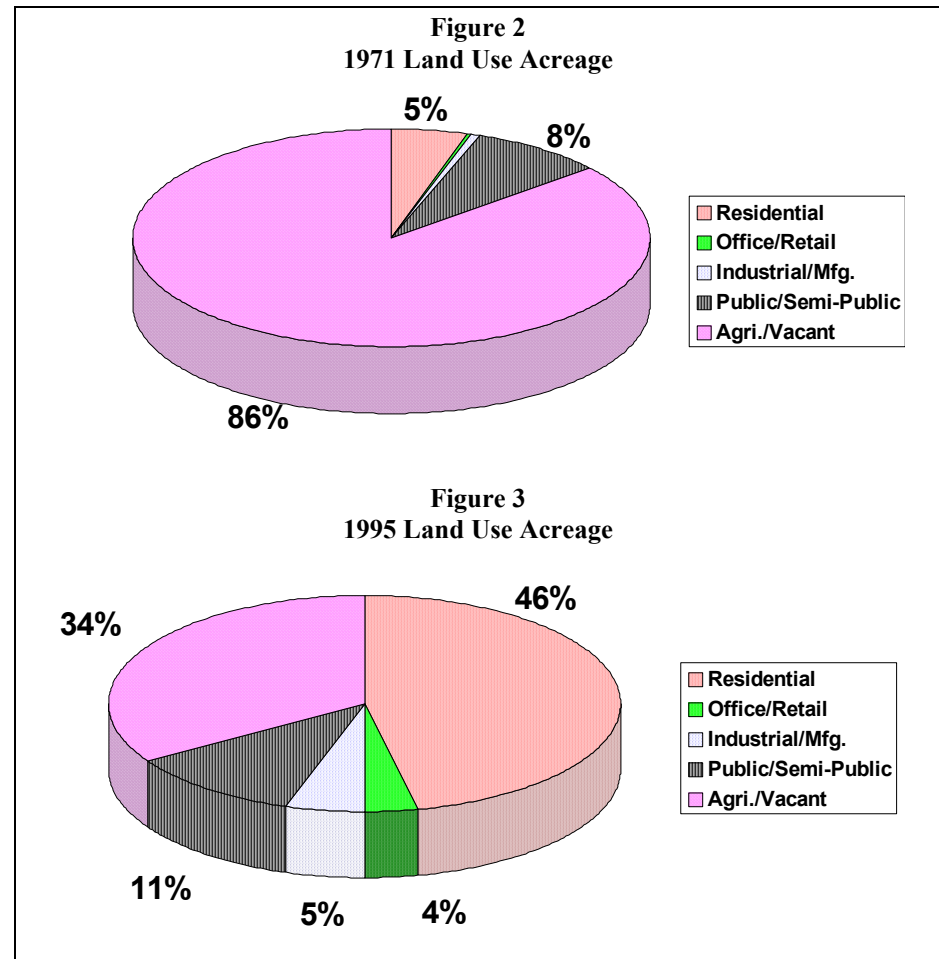
<b>Figure 1</b> <b>Carmel/Clay Township Historic Population Trends</b>						
<b>Census Year</b>	<b>1940</b>	<b>1950</b>	<b>1960</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>
<b>Hamilton County</b>	<b>24,614</b>	<b>28,491</b>	<b>40,132</b>	<b>54,532</b>	<b>82,027</b>	<b>108,936</b>
<b>Clay Township</b>	<b>1,528</b>	<b>2,311</b>	<b>10,215</b>	<b>19,518</b>	<b>32,606</b>	<b>43,007</b>
<b>City of Carmel</b>	<b>771</b>	<b>1,009</b>	<b>1,442</b>	<b>6,568</b>	<b>18,272</b>	<b>25,380</b>
<b>Median Household Size</b>	<b>Unavailable</b>	<b>Unavailable</b>	<b>Unavailable</b>	<b>3.4</b>	<b>3</b>	<b>2.6</b>

\*Delaware-Clay Township line moved to White River from Range Line Road in 1955

under 20,000 in 1970. The City of Carmel increased by over 400% in this same period. This growth pattern has continued in both the Township and City over the last 25 year period.

With a land area of approximately 50 square miles, Clay Township's land-use patterns have significantly changed over the last 25 year period. In 1970, approximately 86% of the land area was vacant or used for agricultural purposes. In 1995, only approximately 34% of the land area remains as vacant or agricultural. Figures 2 and 3 depict the historic urbanization between 1971 and 1995.

Clearly a significant portion of the growth in the area has been residential, however commercial, retail, and office growth have also been significant. As demonstrated by data supplied by F.C. Tucker Company Inc., there is a significant amount of office space in the Carmel-Clay area. Beginning in 1990 and every year thereafter, more office space has been absorbed or leased in suburban areas than in downtown Indianapolis. The Carmel-Clay office market has been the primary beneficiary of this phenomenon and today boasts more office space than any other suburban area outside of downtown Indianapolis. Figures 4, 5 and 6 depict the suburban office and retail markets, and the market position Carmel has established.

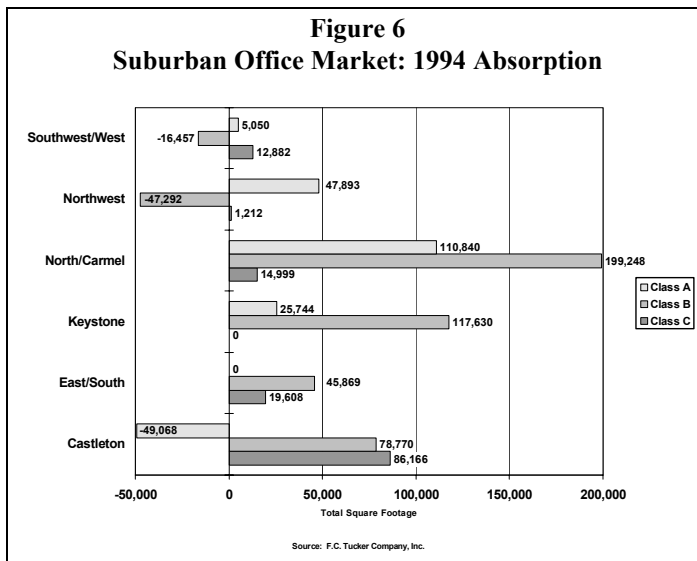
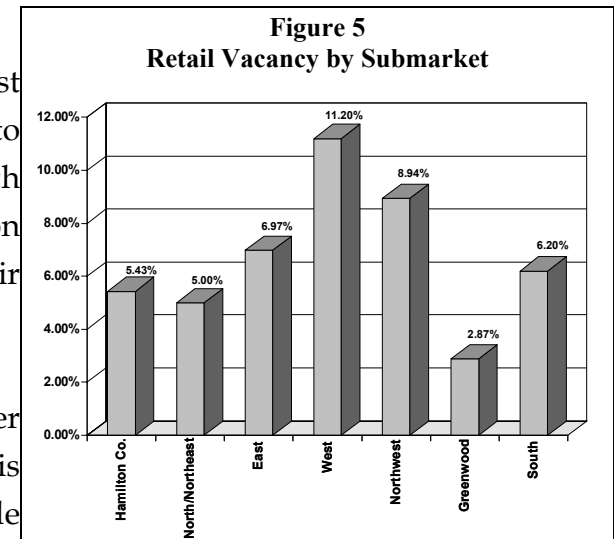




## TRENDS AND PROJECTIONS

The Carmel-Clay Township area has undergone tremendous change in the last twenty-five year period. With only around a third of the land area remaining to sustain growth it becomes useful to estimate the time period over which continued urbanization will build out the area. Three population projection models (Figures 8, 9, & 10) have been prepared and reviewed for their applicability.

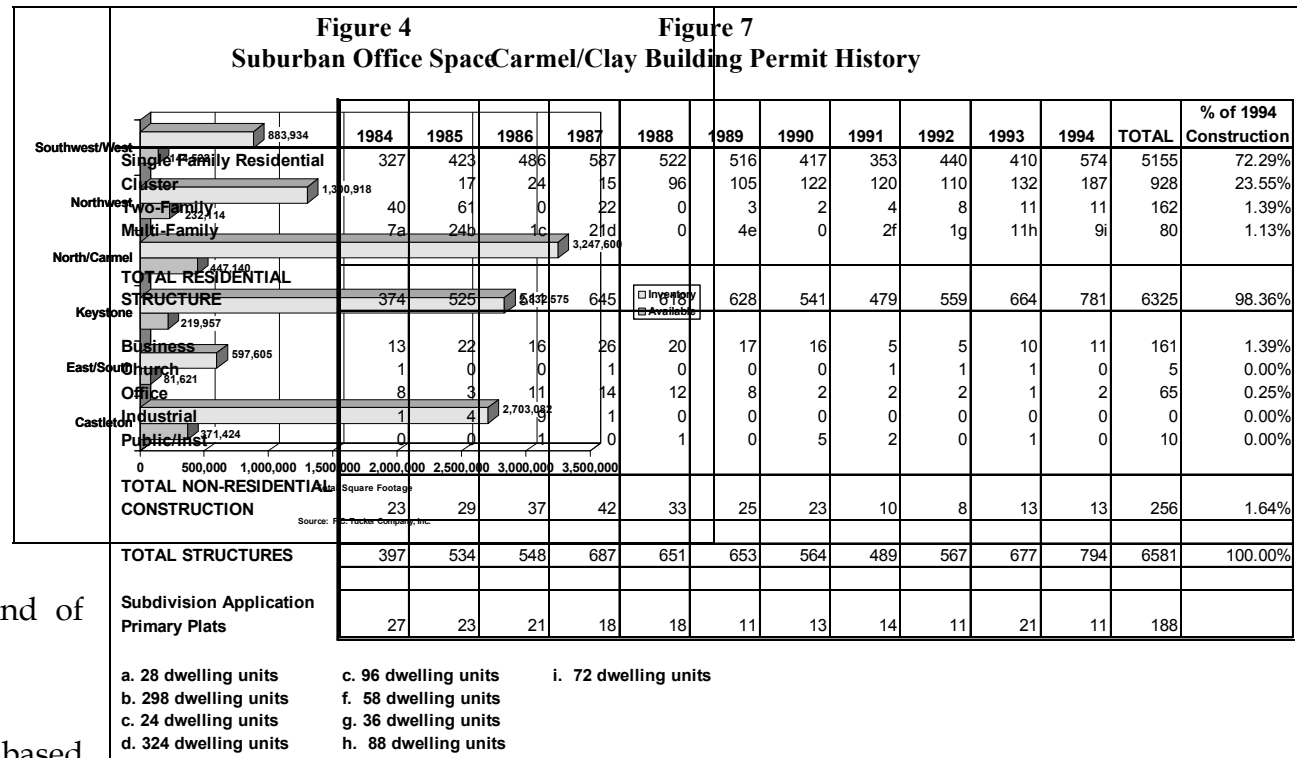
The first methodology is a projection of population made by the IUPUI Center for Urban Policy in its report for the City of Carmel in December 1993. This projection is considered too conservative in that the population projection made



for the year 2010 (53,560) has nearly already been exceeded. It is estimated that the current population of Clay Township is 51,470.

A second methodology has been prepared by HNTB and consists of using State of Indiana projections for Hamilton County and taking out a pro rata share of population growth based on historic trends for Clay Township. This methodology also appears conservative in that its projections for the year 2000 have been equaled by the end of 1995.

The third methodology is based upon historic building permit trends. This alternative has been selected as being the most accurate of the methodologies. As shown in Figure 7, an average of 632 single family residential building permits were issued annually during the previous ten year period. The distribution ranges from a low of 327 single family permits in 1984 to a high of 781 permits in 1994.



Using this methodology, the Carmel-Clay area is projected to have a population of just under 60,000 persons in the year 2000 and approximately 85,000 in the year 2015.

As noted previously, an area representing approximately one-third of the land area of Clay Township remains in undeveloped condition. This equates to a land area of just around 16 square miles. In assessing current building density trends it is clear that buildout of Clay Township would occur before the year 2020 if current trends continue. Figure 11 is an estimate of land uses in the year 2010 given current building density trends and projections of continued population growth. As can be noted from this table, Clay Township could achieve buildout status in approximately fifteen years. This

**Figure 8  
Population Projection Methodology #1**

Census Year	1990	2000	2010	2020
Clay Township*	43,007	49,980	53,560	Unavailable

Source: IUPUI Center for Urban Policy Research, A Report on the City of Carmel, December 1993.

**Figure 9  
Population Projection Methodology #2**

Census Year	1970	1980	1990	2000	2010	2020
Hamilton County	54,532	82,027	108,936	127,800	136,900	140,900
Clay Township*	19,518	32,606	43,007	51,120	54,760	56,560
Township as % of County	35.79%	39.75%	39.48%	40.00%	40.00%	40.14%
Median Household Size	3.40	3.00	2.60	2.60	2.60	2.60

\*Clay Township projections made by HNTB are based on the Township's historic percentage of Hamilton Co.

Source: Indiana Counties Projections, IU School of Business, 1993.

**Figure 10  
Population Projection Methodology #3**

Census Year	1990	1995	2000	2010	2020
Clay Township*	43,007	51,470	59,933	76,859	93,785

\*Between 1990 & 1995 a total of 3,255 residential building permits were issued. This methodology uses 1990 Census population, median household size figures, and building permit data to calculate population growth since 1990. An assumption of continued growth of 640 dwelling units per year in Clay Township is used to project future population figures.

Source: Carmel Department of Community Services Building Permit Trends, 1995.



projection assumes no dramatic increases in building densities to accommodate the growth in population of approximately 35,000 more residents than currently reside in Carmel and Clay Township today.

## COMMUNITY FACILITIES

Within Carmel and Clay Township, there are eleven school sites making up the Carmel-Clay School District. This includes eight elementary schools, two junior high schools and one senior high school. Of these eleven schools only one is located in the western third of the township. In anticipation of continued growth and demand for facilities in western Clay Township the school district has acquired two school sites which are currently vacant. This includes a forty acre tract located at the southwest corner of what would be 120th St. and Towne Road and a 160 acre parcel at the southeast corner of 126th St. and Shelbourne. The Carmel-Clay School District has been proactively planning for growth in its service area. In conversations with school officials the following standards are used in sizing both land area and enrollment for elementary and junior high school sites. Elementary schools are sized to accommodate an enrollment of approximately 600 students in grades K - 5. These elementary schools typically are constructed on a 25 acre site. Junior high schools are sized to accommodate an enrollment of approximately 1,000 students in grades 6 - 8. These facilities are constructed on 40 acre sites. Considerable debate has occurred about the need for a second high school. Currently no long term plans anticipate the need for such facility and that increased enrollment will be accommodated through expansion of existing facilities.



<b>Figure 11</b> <b>Carmel/Clay Township Land Use Trends</b>								
Census Year	1971*		1985*		1995**		2015**	
	Acres	%	Acres	%	Acres	%	Acres	%
Residential	1,463	4.67%	5,401	17.24%	14,413	46.00%	19,213	61.32%
Commercial	84	0.27%	397	1.27%	2,819	9.00%	3,200	10.21%
Industrial	161	0.51%	1,228	3.92%		0.00%	2,240	7.15%
U.S. 31 Corridor		0.00%		0.00%		0.00%	5,112	16.32%
Other Public/Semi-Public	2,556	8.16%	3,341	10.66%	3,540	11.30%	1,567	5.00%
Vacant/Undev./Agri.	27,068	86.39%	20,965	66.91%	10,560	33.70%		0.00%
<b>TOTAL</b>	<b>31,332</b>	<b>100.00%</b>	<b>31,332</b>	<b>100.00%</b>	<b>31,332</b>	<b>100.00%</b>	<b>31,332</b>	<b>100.00%</b>
<small>*1971 &amp; 1985 estimates completed by Woolpert. Streets were included in the Public/Semi-Public Land Use Category.  **1995 &amp; 2015 estimates prepared by HNTB. Streets included in all land use types.</small>								

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In reviewing the population projections selected for use in the previous section, it is anticipated that an additional 25,000 residents will move into Clay Township before it meets its buildout condition in approximately 2015. Using current family size models and age distributions it is anticipated that of these 25,000 residents approximately 21% or 5,250 will be school age. Of this 5,250 approximately 43% or 2,272 would be elementary school age, 21% or 1,103 would be junior high age and 36% or 1,875 would be senior high age. This would equate to the need of between three and four new elementary schools and one new junior high school. From a projected residential growth location standpoint, it appears that at least one of these new elementary schools would need to be on the far northeast reaches of the township and two new elementary schools located in the western third of the township. The projected new junior high school would also be warranted to be located in the western third of the township.

Public parkland sites in Carmel and Clay Township are few in number and are depicted on the Community Facilities Map. Another characteristic depicted on this Figure is public and private golf courses. While public parks are few in number public and private golf courses providing open space throughout the township are very plentiful. In total there are eight golf courses within Carmel and Clay Township. These golf courses include:

**Public Courses**

- Sunrise
- Plum Creek
- Brookshire
- Prairie View

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- Mohawk Hills

#### **Private Courses**

- Woodland Country Club
- Crooked Stick
- Twin Lakes

Many of these golf courses are creative uses of floodplain areas within the township.

Another series of community facilities which have been used in varying locations as a community asset are a series of major pipelines throughout the township. These pipelines include major gas lines which cannot be built over. Each of these lines possess the potential for use as a trail segment. All of these pipelines run diagonally across the township in a southwesterly direction. The three most northern of these four pipelines traverse across the least developed portion of the township and provide the opportunity for trail segments. Some segments of the most northern pipeline have been used as a trail segment through various subdivisions.

The most valuable asset from the standpoint of trail segments is the Monon rail right-of-way. At approximately 5.25 miles in length, it is projected that upon acquisition by the City it will add over twenty five acres of additional park land.

